3.8 Hydrology and Water Quality

This section describes the existing conditions and potential impacts pertaining to hydrology and water quality that would result from the proposed project. It includes a discussion of impacts related to the septic system proposed as a component of the project. Mitigation measures are recommended for those impacts that were determined to be potentially significant.

3.8.1 Existing Conditions

Environmental Setting

This section discusses the existing conditions in the project area.

Climate, Precipitation, and Topography

The project area is characterized by a Mediterranean climate with wet, cool winters and hot, dry summers. Most of the rainfall occurs from November through March, with an average annual precipitation of 28.31 inches (Western Regional Climate Center 2004), but it may reach as high as 50–70 inches per year based on isohyet maps (lines of equal precipitation). Precipitation near the project area ranges from approximately 3 to 7.5 inches during a 10-year, 24-hour[1] storm and from 4 to 10 inches during a 100-year, 24-hour storm (Western Regional Climate Center 2007). The project area is located on Hatchet Mountain, a long, broad, north–south trending ridgeline in the southern Cascade Mountains, leading to the summit of Hatchet Mountain at an elevation of approximately 5,470 feet.

Surface Water Hydrology

The project area is within the Sacramento River hydrologic region, which extends from the Cascade Range at the Oregon border to the Sacramento–San Joaquin Delta, and is generally bound by the Sierra Nevada, the southern Cascades, the Coast Ranges, and the Klamath Mountains. The Sacramento River hydrologic region encompasses approximately 17.4 million acres and produces an average annual runoff of 22.4 million acre-feet. The Sacramento River is the principal surface water body in the basin. Its major tributaries are the Pit and McCloud Rivers, which join the Sacramento River from the northeastern portion of the watershed, and the Feather, Yuba, Bear, and American Rivers, which are tributaries from the Sierra Nevada on the east. (California Department of Water Resources 2003.)

The project area is located in the Lower Pit River watershed (U.S. Geological Survey Hydrological Unit Code 18020003), which encompasses approximately 1,708,590 acres (U.S. Environmental Protection Agency 2007). The Lower Pit River watershed drains to the Sacramento River and ultimately to the Sacramento–San Joaquin Delta. The Pit River, the primary surface water body in the watershed, flows to Shasta Lake, which is a surface storage reservoir operated by the U.S. Bureau of Reclamation. Surface waters in the watershed near the project area include Little Hatchet Creek, Hatchet Creek, Roaring Creek, Carberry Creek, Lake Margaret, and Goose Creek (Figure 3.8-1). Carberry Creek and Little Hatchet Creek are

[1] The 10-year, 24-hour precipitation estimate refers to the approximate amount of rainfall that is expected to fall over a 24-hour period during a 10-year storm event, or an event that has a 10% percent probability of occurring during a normal year.

tributaries of Hatchet Creek. Hatchet Creek drains to Montgomery Creek and ultimately to the Pit River, approximately 4 miles north and 8 miles west of the project area (Figure 3.8-1). Roaring Creek is also a tributary of the Pit River (CH2MHill 2005). Lake Margaret, a reservoir on Goose Creek, is located on the east side of Hatchet Mountain, approximately 1.5 miles east of the proposed project. Goose Creek is a tributary of Burney Creek, which is a tributary of the Pit River.

Flows in the smaller surface waters near the project area, such as Hatchet Creek and Roaring Creek, are primarily dependent on local precipitation and snowmelt runoff, while the Pit River's flows are also controlled by upstream hydroelectric dams. Hatchet Creek's average flows near Montgomery Creek range from 0.26 cubic feet per second (cfs) in September to 63 cfs in March and April (U.S. Geological Survey 2006a). Roaring Creek's average flows follow a similar seasonal pattern, ranging from 0 to 64 cfs (U.S. Geological Survey 2006b). Average flows in the Pit River are substantially greater than both Hatchet and Roaring Creeks' flows, ranging from 3,080 cfs in August to 7,850 cfs in March (U.S. Geological Survey 2006c).

Flooding

The Federal Emergency Management Agency (FEMA) Flood Insurance Rate Maps (FIRMs) categorize and rank areas that are susceptible to flooding. The project area is in FEMA-designated Zone D, which indicates areas where the flood hazards are uncertain but possible (Figure 3.8-2). However, the project area is located on a mountain ridge at an elevation of approximately 5,470 feet, which is substantially higher than local surface waters and likely higher than the undefined floodplain area.

Groundwater Hydrogeology

The project area does not overlie a defined groundwater basin or subbasin. Limited quantifiable information is available on the hydrogeologic conditions underlying the project area and in Shasta County (Shasta County 2004). It is known that volcanic soils, specifically the Modoc Plateau volcanics, underlie the project area (Figure 3.8-3). Modoc Plateau volcanics are generally some of the most productive volcanic rocks in California, with typical well yields ranging from 100 to 1,000 gallons per minute (California Department of Water Resources 2003). Because groundwater in volcanic soils is generally found in fractures in these soils, it is difficult to define the location and quantity of groundwater in these soil types. In general, groundwater conditions in Shasta County are not in overdraft. (Shasta County 2004.)

Surface Water Quality

CWA Section 303(d) established the Total Maximum Daily Load (TMDL) process to assist in guiding the application of state water quality standards; this process requires the states to identify streams whose water quality is impaired (affected by the presence of pollutants or contaminants) and to establish the TMDL (the maximum quantity) of particular contaminants that a water body can assimilate without experiencing adverse effects. The Pit River is listed on the 303(d) list as impaired for nutrients, organic enrichment/low dissolved oxygen, and water temperature. The potential causes of these impairments are agriculture and grazing. (State Water Resources Control Board 2006.)

Water quality information is not available for smaller surface waters near the project area, such as Hatchet, Roaring, and Goose Creeks. In general, the surface water quality of Shasta County is good (Shasta County 2004). The water quality of these local surface waters would be affected by

local land uses. Recent fires in the watershed are likely to lead to increased erosion and sedimentation as a result of reduced vegetative cover to stabilize soils. Eroded material from these fires may include elevated levels of total and dissolved organic carbon.

Groundwater Quality

Detailed information on the quality of groundwater potentially underlying the proposed project is limited because the proposed project does not overlie a defined groundwater basin. However, groundwater quality in Shasta County is generally considered good and suitable to support beneficial uses. Potential hazards to groundwater quality in Shasta County include nitrates and dissolved solids from agricultural operations and septic tank failures. (Shasta County 2004.)

Regulatory Setting

This section discusses federal, state, and local regulations related to hydrology and water quality that would apply to the proposed project.

Federal

Clean Water Act and Associated Environmental Compliance

The CWA is the primary federal law that protects the quality of the nation's surface waters, including lakes, rivers, and coastal wetlands. It operates on the principle that all discharges into the nation's waters are unlawful unless specifically authorized by a permit; permit review is the CWA's primary regulatory tool. Relevant sections of the CWA are discussed below.

Section 303

The State of California adopts water quality standards to protect beneficial uses of state waters as required by Section 303 of the CWA and the Porter-Cologne Water Quality Control Act of 1969 (Porter-Cologne). Section 303(d) of the CWA established the TMDL process to guide the application of state water quality standards (see discussion of state water quality standards below). To identify candidate water bodies for TMDL analysis, a list of water quality–limited streams was generated. These streams are impaired by the presence of pollutants, including sediment, and are more sensitive to disturbance. Section 303(d) listing associated with water bodies in the project region is described in the environmental setting above.

Section 401

Under CWA Section 401, applicants for a federal license or permit to conduct activities that may result in the discharge of a pollutant into waters of the United States must obtain certification from the state in which the discharge would originate, or, if appropriate, from the interstate water pollution control agency with jurisdiction over affected waters at the point where the discharge would originate. Therefore, all projects that have a federal component and may affect state water quality (including projects that require federal agency approval, such as issuance of a Section 404 permit) must also comply with CWA Section 401. Section 401 certification or waiver is under the jurisdiction of the Central Valley Water Board for the proposed project. A Section 401 waiver establishes standard conditions that apply to any project that qualifies for a waiver.

Section 402

CWA Section 402 regulates point-source and nonpoint-source discharges to waters of the United States through the NPDES program, administered by the EPA. EPA has granted the State of

California (the State Water Resources Control Board [State Water Board] and RWQCBs) primacy in administering and enforcing the provisions of CWA and NPDES. Applicable NPDES permits required for the proposed project are described in further detail below.

Section 404

CWA Section 404 regulates the discharge of dredged and fill material into waters of the United States, which include oceans, bays, rivers, streams, lakes, ponds, and wetlands. Project proponents must obtain a permit from the U.S. Army Corps of Engineers (USACE) for all discharges of dredged or fill material into waters of the United States, including wetlands, before proceeding with a proposed activity. Before any actions that may affect surface waters are carried out, a delineation of jurisdictional waters of the United States must be completed, following USACE protocols, in order to determine whether the project area encompasses wetlands or other waters of the United States that qualify for CWA protection. Jurisdictional waters are broadly defined below.

- Areas within the ordinary high water mark (OHWM) of a stream, including nonperennial streams with a defined bed and bank and any stream channel that conveys natural runoff, even if it has been realigned.
- Seasonal and perennial wetlands, including coastal wetlands.

Wetlands are defined for regulatory purposes as areas "inundated or saturated by surface or ground water at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions" (33 CFR 328.3; 40 CFR 230.3).

Section 404 permits may be issued only for the least environmentally damaging practicable alternative. That is, authorization of a proposed discharge is prohibited if there is a practicable alternative that would have fewer adverse impacts and that lacks other significant adverse consequences.

Safe Drinking Water Act

The Safe Drinking Water Act, as amended in 1986 and 1996, requires protection of drinking water and its sources (i.e., rivers, lakes, reservoirs, springs, and groundwater wells). The act authorizes EPA to set national standards for drinking water to protect against pollutants. EPA, states, and local agencies work together to enforce these standards.

State

Porter-Cologne Water Quality Control Act

Overview

The Porter-Cologne Act, passed in 1969, works in conjunction with the federal CWA. It established the State Water Board and divided the state into nine regions, each overseen by an RWQCB. The State Water Board is the primary state agency responsible for protecting the quality of the state's surface and groundwater supplies, but much of its daily implementation authority is delegated to the nine RWQCBs, which are responsible for implementing CWA Sections 303(d), and 402. In general, the State Water Board manages both water rights and statewide regulation of water quality, while the RWQCBs focus exclusively on water quality in their regions. The Pit River watershed is under the jurisdiction of the Central Valley Water Board.

The Porter-Cologne Act provides for the development and periodic review of basin plans, which designate beneficial uses of California's major rivers and groundwater basins and establish narrative and numerical water quality objectives for those waters (Central Valley Regional Water Quality Control Board 2007). Basin plans are primarily implemented by using the NPDES permitting system to regulate waste discharges so that water quality objectives are met (see discussion of the NPDES system in *Clean Water Act* above). The Central Valley Water Board has adopted a Water Quality Control Plan (Region 5 Basin Plan) (2007) to implement plans, policies, and provisions for water quality management in the region. Beneficial uses of surface waters are identified (for major surface waters and their tributaries) and described in the Region 5 Basin Plan. In addition, the Region 5 Basin Plan identifies water quality objectives for protecting the beneficial uses of the basin.

Beneficial uses of the Pit River, Shasta Lake, and the Sacramento River (from Shasta Dam to Colusa Basin Drain) as described in the Region 5 Basin Plan are very similar. Existing beneficial uses of all three water bodies are municipal and domestic supplies; agricultural supply; non-contact and contact water recreation; warm and cold freshwater habitat; spawning, reproduction, and/or early development; and wildlife habitat. The Sacramento River from Shasta Dam to Colusa Basin Drain also supports beneficial uses of navigation, migration of aquatic organisms, and industrial service supply. Shasta Lake, the defined Sacramento River reach, and the Pit River also support beneficial uses of hydropower generation. (Central Valley Regional Water Quality Control Board 2007.)

Construction Activities

Construction activities are regulated under the NPDES General Permit for Discharges of Storm Water Runoff Associated with Construction Activity (General Construction Permit), provided that the total amount of ground disturbance during construction exceeds 1 acre. The Central Valley Water Board would enforce the General Construction Permit for the proposed project. Coverage under a General Construction Permit requires the preparation of a SWPPP and notice of intent (NOI). The SWPPP includes pollution prevention measures (erosion and sediment control measures and measures to control non-stormwater discharges and hazardous spills), demonstration of compliance with all applicable local and regional erosion and sediment control standards, identification of responsible parties, a detailed construction timeline, and a BMP monitoring and maintenance schedule. The NOI includes site-specific information and the certification of compliance with the terms of the General Construction Permit.

Local

Shasta County General Plan

The following Shasta County General Plan (2004) objectives and policies would be applicable to the proposed project.

5.1 Seismic and Geologic Hazards

Objectives

SG-4 Protection of waterways from adverse water quality impacts caused by development on highly erodible soils.

Policies

SG-d Shasta County shall develop and maintain standards for erosion and sediment control plans for new land use development. Special attention shall be given to erosion prone hillside

areas, including those with extremely erodible soil types such as those evolved from decomposed granite.

SG-f Shasta County shall pursue preparation of development standards based on topography and soil erosion potential in revising its land capability standards pursuant to Policy CO-h.

5.2 Flood Protection

Objectives

FL-1 Protection of public health and safety, both on-site and downstream, from flooding through floodplain management which regulates the types of land uses which may locate in the floodplain, prescribes construction designs for floodplain development, and requires mitigation measures for development which would impact the floodplain by increasing runoff quantities.

Policies

FL-a New development in floodplains shall be regulated through zoning regulations addressing land use type, density, and siting of structures.

FL-c Whenever possible, flood control measures should consist of channel diversions or limited floodplain designs which avoid alteration of creeks and their immediate environs.

FL-h The impacts of new development on the floodplain or other downstream areas due to increased runoff from that development shall be mitigated. In the case of the urban or suburban areas, and in the urban and town centers, the County may require urban or suburban development to pay fees which would be used to make improvements on downstream drainage facilities in order to mitigate the impacts of upstream development.

6.6 Water Resources

Objectives

W-9 Institute effective measures to protect groundwater quality from potential adverse effects of increased pumping or potential sources of contamination.

Policies

W-a Sedimentation and erosion from proposed developments shall be minimized through grading and hillside development ordinances and other similar safeguards as adopted and implemented by the County.

W-b Septic systems, waste disposal sites, and other sources of hazardous or polluting materials shall be designed to prevent contamination to streams, creeks, rivers, reservoirs, or groundwater basins in accordance with standards and water resource management plans adopted by the County.

W-d The potential for cumulative water quality impacts resulting from widespread use of septic systems in poorly suited soil areas shall be periodically evaluated by the County for the need to provide greater monitoring and possible changes to applicable sewage disposal standards.

Septic System Regulations

The proposed project would be required to comply with septic system guidelines enforced by EHD. Regulation and enforcement of these guidelines is primarily provided by the County's septic system permit process. A septic system permit is required prior to the installation of a

new or replacement septic tank and leach field or the repair of an existing failing system. A permit application must be submitted along with a complete site plan, fees, and soil test data. A summary of the septic system design guidelines and other requirements to obtain permit approval are provided below.

Shasta County Septic Tank and Leach Line Guidelines

EHD requires that new or replacement septic systems comply with its *Septic Tank and Leach Line Design, Construction, and Installation Guidelines*. The guidelines include specific requirements on: septic tank capacities; septic tank materials and design; the depth, spacing, and length of leach lines; required minimum area of leach fields; allowable backfill material; watertight requirements for certain components of the system; and minimum setbacks from local surface water bodies, wells, or water supply systems. In addition, the guidelines require that septic systems not be operated until a representative of EHD has approved the system. The County's representative may also require a landowner to comply with more stringent requirements. These guidelines are enforced to ensure the protection of groundwater and surface water quality.

Shasta County Sewage Disposal Standards

Sewage disposal standards, determined by EHD, provide additional guidance concerning the septic system design, construction, and permitting requirements (Shasta County 2001). Information, protocols, and requirements included in the standards document pertain to disposal areas, soil percolation tests, groundwater monitoring, septic system permit applications and approval, and disposal material characteristics.

3.8.2 Impact Analysis

This section describes the analysis of impacts relating to hydrology and water quality. It describes the methods used to determine the proposed project's impacts and the thresholds used to the levels of significance of those impacts. Measures to mitigate (avoid, minimize, rectify, reduce, eliminate, or compensate for) significant impacts accompany each impact discussion.

Methodology

The evaluation of hydrology and water quality effects is based on professional standards. The key effects were identified and evaluated on the basis of the physical characteristics of the project area and the magnitude, intensity, and duration of activities. Impacts on hydrology and water quality that may result from construction of the project are primarily described at a qualitative project level. Specific mitigation measures to avoid, minimize, rectify, reduce, eliminate, or compensate for potential significant impacts on hydrology or water quality are described for each impact.

Thresholds of Significance

Criteria for determining the significance of impacts related to hydrology and water quality were based on the environmental checklist form in Appendix G of the State CEQA Guidelines (14 CCR 15000 et seq.). An impact related to hydrology and water quality was considered significant if it would result in any of the conditions listed below.

- Violate any water quality standards, waste discharge requirements, or otherwise substantially degrade water quality.

- Substantially deplete groundwater supplies or interfere substantially with groundwater recharge, resulting in a net deficit in aquifer volume or a lowering of the local groundwater table level (e.g., the production rate of preexisting nearby wells would drop to a level that would not support existing land uses or planned uses for which permits have been granted).

- Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, in a manner that would result in substantial erosion or siltation on site or off site.

- Substantially degrade the existing surface or groundwater quality as a result of erosion and siltation.

- Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, or substantially increase the rate or amount of surface runoff in a manner that would result in flooding on site or off site.

- Create or contribute runoff water that would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff.

- Place housing within a 100-year flood hazard area, as mapped on a federal Flood Hazard Boundary or Flood Insurance Rate Map or other flood hazard delineation map.

- Place within a 100-year flood hazard area structures that would impede or redirect floodflows.

- Expose people or structures to a significant risk of loss, injury, or death involving flooding, including flooding as a result of the failure of a levee or dam.

- Contribute to inundation by seiche, tsunami, or mudflow.

- Place a septic system in an area that is unsuitable for the use of septic tanks, because of the nature of site soils, or other constraints.

Impacts and Mitigation Measures

Impact HYD-1: Degradation of water quality resulting from construction (less than significant with mitigation)

Construction activities introduce the potential for increased erosion and sedimentation, with subsequent effects on water quality and storm drainage capacity. During site grading, trenching, and construction activities, areas of bare soil are exposed to erosive forces for long periods of time. Bare soils are much more likely to erode than vegetated areas because of the lack of dispersion, infiltration, and retention properties created by covering vegetation. Construction activities involving soil disturbance, excavation, cutting/filling, stockpiling, and grading could result in increased erosion and sedimentation to surface waters. If precautions are not taken to contain contaminants, construction could introduce contaminants into stormwater runoff (nonpoint source pollution), a major contributor to the degradation of water quality.

Specific activities proposed as part of project construction that have the potential to generate construction-related water quality effects are the construction of wind turbines, an operations and maintenance building, and access roads; replacement of existing drainage culverts; and the burying of communication system cabling. In the absence of proper BMPs or other water quality protection measures, sediment and other pollutants could be transported off site and

could degrade the water quality of surface water bodies such as Little Hatchet Creek, Hatchet Creek, and Roaring Creek.

Heavy equipment would be used to construct the project. Accidental spills of hazardous vehicular and equipment fluids may occur during construction activities. These potential spills, if not contained, could contaminate groundwater and surface waters.

This would be considered a significant impact on groundwater and surface water quality. Implementation of Mitigation Measures HAZ-1 and, if necessary, HYD-1, would reduce this impact to a less-than-significant level.

Mitigation Measure HAZ-1: Prepare a Hazardous Materials Business Plan/Spill Prevention Control and Countermeasures Plan

This mitigation measure is described in detail in Section 3.7, *Hazards and Hazardous Materials*.

Mitigation Measure HYD-1: Implement measures to maintain groundwater and surface water quality in case of accidental spills

If an appreciable spill has occurred and results determine that project activities have adversely affected surface or groundwater quality, the County will be responsible for ensuring that a detailed analysis is performed by a registered environmental assessor to identify the likely cause of contamination. This analysis will conform to American Society for Testing and Materials standards and will include recommendations for reducing or eliminating the source or mechanisms of contamination. Based on this analysis, the project proponent and/or the County will select and implement measures to control contamination, with a performance standard that groundwater quality must be returned to baseline conditions. These measures will be subject to approval by the County.

Impact HYD-2: Potential to alter the existing drainage pattern or contribute to existing local or regional flooding (less than significant)

Most of the project area is currently vacant land or open space with pervious surfaces. Implementation of the project would result in the construction of impermeable surfaces (the wind turbine foundations and the O&M building and, to a lesser degree, the widening of access roads). In addition, the project would require the removal and replacement of existing culverts along existing roads.

Construction of the proposed project could potentially reroute or alter existing drainage patterns through grading, replacement of the culverts, and other construction activities. Changes to the project area's land surface and increase in impermeable surfaces could alter runoff patterns and possibly result in flooding on or off site.

If the proposed project results in the transport of additional runoff offsite, significant erosion could occur in nearby waterways, specifically the Little Hatchet Creek, Roaring Creek, or Goose Creek drainage systems. However, the amount of new impermeable surfaces associated with the wind turbines and O&M facility would not result in a significant increase in the quantity of runoff or significantly alter the existing drainage patterns. Culvert replacements would be made, as necessary, to control stormwater runoff such that drainage patterns would not be altered. Accordingly, this impact would be less than significant. No mitigation is required.

Impact HYD-3: Potential to expose people or structures to flood hazards (less than significant)

People and structures could be at risk if project structures are constructed in a 100-year floodplain. Additionally, structures built in the floodplain could impede or redirect flood flows, potentially resulting in flood-related impacts in areas that were previously unaffected.

Most of the project area is in an area of undetermined but possible flood hazards (Zone D) (Figure 3.8-3). However, the project area is located on a mountain ridge at an elevation of approximately 5,470 feet, which is substantially higher than local surface waters and likely higher than the undefined floodplain in the area. Accordingly, this impact is considered less than significant. No mitigation is required.

Impact HYD-4: Depletion of groundwater supplies (less than significant)

Land uses in the project area are limited to timber production, communications development, and associated infrastructure and access roads. The proposed project would entail the construction of impermeable surfaces through the widening of access roads and the construction of an O&M facility and wind turbine foundations. These impermeable surfaces would decrease the potential area available for groundwater recharge. However, because groundwater recharge could still occur at numerous other locations in the project area and throughout Shasta County, the introduction of a limited extent of impermeable surface associated with the proposed project would not significantly alter the groundwater recharge or available groundwater supplies.

Groundwater would likely be the primary water supply for the kitchen, shower, and bathroom in the O&M building during the operation of the project. A well would be constructed as part of the project to supply the groundwater. The use of groundwater during operation of the project could potentially decrease local groundwater levels and the overall groundwater supply.

Existing groundwater conditions in the project area are relatively unknown because the project does not overlie a defined aquifer and no local groundwater level data were available. The project area overlies volcanic soils (Figure 3.8-3), which can be water-bearing units. However, it is difficult to quantify the location and amount of groundwater in these types of soils (Shasta County 2004).

The potential groundwater use for the project operations would be less than 5,000 gallons per day. Groundwater use would only occur if the project applicant determines groundwater is available in the project area and sufficient to support the project's uses. It is unlikely the project would significantly affect groundwater supplies or nearby groundwater users because of the small quantity being consumed for the project. This impact is considered less than significant.

Impact HYD-5: Potential water quality impacts from project operations (less than significant)

The proposed project would result in the construction of impermeable surfaces through the widening of existing access roads and construction of the wind turbines and O&M facility. These impermeable surfaces could potentially increase runoff from the project area, thereby increasing the potential for pollutants from the project area to be transported to local surface waters. In addition, increased runoff following construction of the proposed project or any altered drainage patterns could potentially result in increased erosion and the transport of sediment to local surface waters.

As described above, runoff from the project's impermeable surfaces would not be significant, and the existing drainage patterns would remain unaltered. Thus, the project's runoff flows would not significantly increase erosion or the transport of sediments. The project would not generate pollutants that could be transported in the runoff, except, potentially, for insignificant amounts of oils or greases from the turbines. Accidental spills of oils, greases, or other pollutants during project operations could result in the transport of pollutants to local surface waters or groundwater. However, implementation of Mitigation Measures HAZ-1 and HYD-1 would reduce the potential for accidental spills. No further mitigation is required.

Impact HYD-6: Potential hazards from seiche, tsunami, or mudflow (less than significant)

Occurrence of a tsunami, seiche, or mudflow could pose a risk to humans or structures following project construction if the area were prone to tsunamis, seiches, or mudflows. All waterbodies (Lake Margaret, Little Hatchet Creek, Carberry Creek) near the project area are at elevations significantly below the project site and are not large enough to pose a significant threat of a seiche. The project is inland and not at risk of a tsunami. The project is near or at the crest of Hatchet Ridge, which experienced a forest fire in 1992 and may consequently be at greater risk of significant erosion and mudflows than the area was before the fire. Operation of the project would not contribute to the risk of mudflows in the project area or downhill of Hatchet Ridge because the project would not significantly increase runoff from the project site or significantly alter existing drainage patterns as described under Impact HYD-2. Although construction activities for the proposed project would involve grading activities that could potentially increase erosion in the area and the potential for mudflows, compliance with CWA requirements and provisions of the County Grading Ordinance (as discussed in Section 3.6, *Geology and Soils*) would ensure that this impact is less than significant. No mitigation is required.

Impact HYD-7: Potential adverse effects as a result of septic system use (less than significant with mitigation)

If the project includes a septic system as originally proposed, project operation could affect ground- and surface water quality if the project's septic system were to function incorrectly or to fail—septic system problems can result in the delivery of nutrients and pathogens to groundwater and/or surface waters. Improperly designed or constructed septic systems can also contribute to slope failure hazards by adding excess moisture to soil and rock materials. At their worst, both types of impacts could be significant.

Regional mapping by the Natural Resources Conservation Service indicates that the suitability of soils in the project area to support septic systems is generally low. However, in order to include a septic system as part of the project, the proponent will need to obtain a County septic permit. As discussed in Chapter 2, the project's septic system would be designed and maintained in accordance with EHD's *Septic Tank and Leach Line Design, Construction, and Installation Guidelines* (Shasta County No Date) and sewage disposal standards. The guidelines include specific requirements on septic tank capacities; septic tank materials and design; depth, spacing, and length of leach lines; required minimum area of leach fields; allowable backfill material; watertight requirements for certain components of the system; and minimum setbacks from local surface water bodies, wells, or water supply systems. The County septic permit process further requires the applicant to conduct groundwater monitoring and soil percolation tests, and to obtain approval of the constructed septic system by a County representative prior to operation of the system. No permit would be issued if the site is found to be unsuitable, or if a site-appropriate design cannot be developed. Consequently, water quality impacts related to a

potential septic system are expected to be less than significant, and no mitigation for water quality is required.

Potential effects of a septic system leach field on slope stability can be addressed through the site-specific geotechnical investigation prepared for the project, as described in Mitigation Measure HYD-2. With this measure in place, septic system impacts on slope stability are also expected to be less than significant.

Mitigation Measure HYD-2: Ensure that the site-specific geotechnical investigation addresses septic system constraints and design

The applicant will ensure that the site-specific geotechnical report prepared for the project includes an evaluation of the site's suitability for the proposed septic system, including the potential for septic leach field use to contribute to risks of slope failure. If appropriate, the geotechnical report will also identify constraints on septic system placement and design. The applicant will be responsible for ensuring that all recommendations of the site-specific geotechnical report are implemented.